REMARKS

The Examiner's Answer was issued in response to the administrative remand from the Board of Appeals of May 27, 2010, in which the Board raised new grounds of rejection under 35 U.S.C. §112. Claims 1-32 and 35 currently stand rejected. By the present response, the applicants have amended claims 1, 13-18, and 21-24 and canceled claim 35. Upon entry of the amendments, claims 1-32 will be pending in the present patent application. Reconsideration and allowance of all pending claims are requested.

Rejections Under 35 U.S.C. §101

In the Examiner's Answer, the examiner raised a new ground of rejection of claims 1-24 under 35 U.S.C. §101. In particular, with respect to claims 1-12, the examiner stated:

> Claims 1-12 are rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter because these are method or process claims that do not transform underlying subject matter (such as an article or materials) to a different state or thing, nor are they tied to another statutory class (such as a particular machine). *See* Diamond v. Diehr, 450 U.S. 175, 184 (1981) (quoting *Benson*, 409 U.S. at 70); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978) (citing *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876)). See also In re Bilski (Fed Cir, 2007-1130, 10/30/2008) where the Fed. Cir. held that method claims must pass the "machine-or-transformation test" in order to be eligible for patent protection under 35 USC 101.
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> *See* Examiner's Answer, page 3 (emphasis in original).

As such, the examiner appears to have rejected claims 1-12 based solely on the "machine-or-transformation" test. The applicants acknowledge that the Office recently adopted this test as the sole test for determining whether a claimed method qualifies as a "process" under 35 U.S.C. § 101, that the Federal Circuit agreed with the Office in *In re*

Bilski (545 F.3d 943 (Fed. Cir. 2008) (en banc)), and that the rejection in the Examiner's Answer appears to be based on a good-faith attempt to apply the machine-or-transformation test as the sole test for patent-eligibility of a method. However, the applicants note that the law has since changed.

On June 28, 2010, the Supreme Court issued its decision in *Bilski v. Kappos*, 561 U.S. ___ (2010). While the Supreme Court did ultimately find Bilski's claims to be unpatentable as an abstract idea, and that the machine-or-transformation test can be a helpful tool in determining whether a method is patentable, the Court was unanimous in rejecting the position taken by the Office and the Federal Circuit with respect to the machine-or-transformation test as a determinative test for whether a claimed method qualifies as a statutory process. For at least this reason, the present rejection of claims 1-12 cannot be sustained.

However, in the interest of advancing prosecution, the applicants have amended independent claim 1 to recite "acquiring a set of motion data during a breath hold using an imaging system." (Emphasis added.) Therefore, the applicants contend that independent claim 1 now explicitly recites that at least the step of "acquiring a set of motion data during a breath hold" is performed on a particular, real-world machine (i.e., the imaging system) specifically configured to acquire such motion data. As such, the applicants respectfully submit that amended independent claim 1 passes the "machine-or-transformation" inquiry.

Furthermore, even if amended independent claim 1 did not pass the "machine-or-transformation" test, the applicants note that the ultimate inquiry is whether independent claim 1 is directed solely to an abstract idea. In *Bilski v. Kappos*, the Supreme Court pointed to its previous decisions in *Benson*, *Flook*, and *Diehr* as guideposts for

determining whether a claim is directed to an abstract idea. The *Benson* Court found that the method claim at issue in that case was essentially nothing more than a mathematical algorithm, and was therefore directed to an abstract idea. The *Flook* Court found that the method claim at issue in that case was essentially nothing more than a mathematical formula with some minor post-solution processing and field-of-use limitations, and was therefore also directed to an abstract idea. The *Diehr* Court found that the method claim at issue in that case, which generally recited the use of a mathematical formula for controlling an industrial process, was not an abstract idea. The applicants again note that amended independent claim 1 recites a real-world machine (e.g., the imaging system). The applicants further submit that independent claim 1 is much closer to the real-world example of *Diehr* than the abstract, mathematical algorithms at issue in *Benson* and *Flook*, and that independent claim 1 is directed to practical, non-abstract subject matter. For at least these reasons, the applicants respectfully request withdrawal of the rejection of claims 1-12 under 35 U.S.C. §101.

With respect to claims 13-24, the examiner stated:

> Claims 13-24, directed towards a computer program embodied on a computer-readable medium, are rejected under 35 U.S.C. § 101 as towards non-statutory subject matter. The United States Patent and Trademark Office (USPTO) is obliged to give claims their broadest reasonable interpretation consistent with the specification during proceedings before the USPTO (*In re Zletz*, 893 F.2d 319 Fed. Cir. 1989); in other words, during patent examination, the pending claims must be interpreted as broadly as their terms reasonably allow. The broadest reasonable interpretation of a claim drawn to a program embodied on a computer readable medium (also called a machine readable medium and other such variations) typically covers forms of non-transitory tangible media and transitory propagating signals *per se* in view of the ordinary and customary meaning of computer readable media, particularly when the specification is silent (MPEP §

> 2111.01). Accordingly, since the broadest reasonable interpretation of claims 13-24 covers a signal *per se*, the claims are considered as covering non-statutory subject matter (*In Re Nuijten*, 500 F.3d 1436, 1356-57 Fed. Cir. 2007; *Interim Examination Instructions for Evaluating Subject Matter Eligibility Under 35 U.S.C. 101*, 24 Aug 2009 p. 2).
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> *See* Examiner's Answer, pages 5-6 (emphasis in original).

As such, the examiner noted that claims 13-24 recite "computer readable media" and that such media could cover forms of transitory signals, and is therefore unpatentable. Although the applicants do note necessarily agree with the examiner's assertions, the applicants have amended independent claim 13 to recite "non-transitory computer readable media." Consequently, even under a broadest reasonable interpretation, the present recitation of "non-transitory computer readable media" cannot be interpreted to include transitory signals *per se*. For at least these reasons, the applicants respectfully request withdrawal of the rejection of claims 13-24 under 35 U.S.C. §101.

Rejections Under 35 U.S.C. §112, Second Paragraph

In the Examiner's Answer, the examiner raised a new ground of rejection of claims 13-24 and 35 under 35 U.S.C. §112, second paragraph. As discussed above, the applicants hereby cancel independent claim 35 and, as such, the rejection of independent claim 35 under 35 U.S.C. §112, second paragraph is now moot. With respect to claims 13-24, the examiner stated:

> Claim(s) 13-24 are rejected under 35 USC § 112, ¶ 2, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim(s) recites/recite the following means plus function limitation: a routine for acquiring a set of motion data, a routine for deriving one or more attributes of motion from the set of motion data, a routine for deriving an initiation threshold and a

termination threshold from the one or more attributes, and a routine for generating a set of gated image data using the initiation threshold and the termination threshold.

The claim limitation does not use the term "means for" or "step for" which triggers a rebuttable presumption that 35 USC § 112, ¶ 6, does not apply. However, this presumption may be rebutted if the claim limitation uses a term that is not an art-recognized structure to perform the claimed function, the term is modified by functional language, and the term is not modified by sufficient structure or material for performing the claim function. *See Ex parte Rodriguez*, 92 USPQ2d 1395, 1404-1406 (Bd. Pat. App. & Int. 2009).

Here, appellant's claim limitation begins with a term followed by functional language and the term is not modified by sufficient structure or material for performing the claimed function. Furthermore, the specification does not provide a description sufficient to inform one of ordinary skill in the art the meaning of the term; and the term is not an art-recognized structure to perform the claimed function. Accordingly, the limitation invokes 35 USC § 112, ¶ 6.

35 USC § 112, ¶ 6, requires such claim to be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof. "If one employs means plus function language in a claim, one must set forth in the specification an adequate disclosure showing what is meant by that language. If an applicant fails to set forth an adequate disclosure, the applicant has in effect failed to particularly point out and distinctly claim the invention as required by the second paragraph of section § 112." *In re Donaldson Co.*, 16 F.3d 1189, 1195, 29 USPQ 1845, 1850 (Fed. Cir. 1994)(in banc.). For a computer-implemented means-plus-function claim limitation that invokes 35 USC § 112, ¶ 6, the corresponding structure is required to be more than simply a general purpose computer. *Aristocrat Technologies, Inc. v. International Game Technology*, 521 F.3d 1328, 1333, 86 USPQ2d 1235, 1239-40 (Fed. Cir. 2008). The corresponding structure for a computer-implemented function must include the algorithm as well as the general

> purpose computer. *WMS Gaming, Inc. v. International Game Technology*, 184 F.3d 1339, 51 USPQ2d 1385 (Fed. Cir. 1999). The written description must at least disclose the algorithm that transforms the general purpose microprocessor to a special purpose computer programmed to perform the claimed function. *Aristocrat*, 521 F.3d at 1338, 86 USPQ2d at 1242.
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> In the instant application, the following portions of the specification and drawings may appear to describe the corresponding structure for performing the claimed function: the imaging system 10 described at pages 14-15 as being used to executed [sic] the routines, and as shown in Figures 2 and 3.
>
> However, the specification and drawings do not disclosure sufficient corresponding structure for performing the claimed function. It appears that the attributes, thresholds and gated image data are derived and generated, respectively, by software in the general purpose computer that is disclosed as part of the claimed structure. However, the specification does not describe how the attributes or thresholds are determined, or how the gated image data is generated. Specifically, the specification does not provide the algorithms for the claimed means for determining the attributes, the claimed means for determining the threshold, or the claimed means for generating the gated image data, and, as such, Appellants have failed to adequately describe sufficient structure for performing the functions claimed.

See Examiner's Answer, pages 7-8 (emphasis in original).

Although the applicants do not necessarily agree with the examiner's assertions, the applicants have amended independent claim 13 to recite a "computer program, provided on one or more non-transitory computer readable media, for gating image data, comprising computer instructions, which when executed" perform the recited method steps. (Emphasis added.) As such, the applicants contend the presumption that 35 U.S.C. §112, sixth paragraph does not apply can no longer be rebutted because: (1) independent claim 13 no longer recites a term (e.g., "routine") that is not recognized in the art, (2) the

term (e.g., "routine") is no longer modified by functional language, and (3) the term (e.g., "routine") is modified by sufficient structure (i.e., "non-transitory computer readable media"). Accordingly, the applicants contend that 35 U.S.C. §112, sixth paragraph no longer applies to claims 13-24. For at least these reasons, the applicants respectfully request withdrawal of the rejection of claims 13-24 under 35 U.S.C. §112, second paragraph.

Rejections Under 35 U.S.C. §102

In the Examiner's Answer, the examiner rejected claims 1-8, 10-20, 22-32, and 35 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,363,844 to Riederer et al. (hereinafter "the Riederer reference"). The applicants respectfully traverse this rejection.

Legal Precedent and Guidelines

During patent examination, the pending claims must be given an interpretation that is reasonable and consistent with the specification. *See In re Prater*, 415 F.2d 1393, 1404-05, 162 U.S.P.Q. 541, 550-51 (C.C.P.A. 1969); *see also* M.P.E.P. §§608.01(o) and 2111. Indeed, the specification is "the primary basis for construing the claims." *See Phillips v. AWH Corp.*, 75 U.S.P.Q.2d 1321, 1326 (Fed. Cir. 2005). One should rely heavily on the written description for guidance as to the meaning of the claims. *See id.*

Furthermore, in *Phillips v. AWH Corp.*, the Federal Circuit held that dictionaries or other similar sources may be used to assist in the interpretation of claim language, but must take an inferior role to the meanings of claim terms as they would be understood by one of ordinary skill in the art in view of the intrinsic evidence. *See, e.g., id.* at 1331. The court further noted that the usage of a term in the specification is the "single best guide to the meaning of [a] disputed term." *See id.* at 1332.

Interpretation of the claims must also be consistent with the interpretation that those skilled in the art would reach. *See In re Cortright*, 165 F.3d 1353, 1359, 49 U.S.P.Q.2d 1464, 1468 (Fed. Cir. 1999); M.P.E.P. §2111. "The inquiry into how a person of ordinary skill in the art understands a claim term provides an objective baseline from which to begin claim interpretation." *See Collegenet, Inc. v. ApplyYourself, Inc.*, No. 04-1202, -1222, 1251, at 8-9 (Fed. Cir. August 2, 2005) (quoting *Phillips*).

Anticipation under 35 U.S.C. § 102 can be found only if a single reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 U.S.P.Q. 773 (Fed. Cir. 1985). Every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). Indeed, the prior art reference also must show the *identical* invention "*in as complete detail as contained in the ... claim*" to support a *prima facie* case of anticipation. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 U.S.P.Q. 2d 1913, 1920 (Fed. Cir. 1989).

The Examiner Improperly Relied Upon Extrinsic Evidence to Define a Term Already Fully Explained in the Present Specification

The examiner, contrary to legal precedent (e.g., the *Phillips* case discussed above), has apparently ignored or given little weight to the present specification. Instead, the examiner has improperly relied upon extrinsic evidence in construing the language of the claims. In particular, independent claims 1 and 25 recite, in generally similar language, generating a set of gated images using one or more gating intervals derived from an initiation threshold and a termination threshold. In addition, independent claims 1, 13, and 25 all recite, in generally similar language, that the termination threshold is derived from one or more attributes of motion from a set of motion data acquired during a breath hold. This is further clarified by reference to the present application, where it is

explained that the termination threshold is determined based on motion data and that the gating intervals are derived from the initiation and termination thresholds. *See, e.g.,* Application, page 1, lines 23-26; page 4, lines 4-7; page 11, lines 11-15. For instance, gating intervals may occur when pulmonary motion is minimal, such as subsequent to an exhalation but prior to an inhalation. *Id.,* page 4, lines 4-7. Therefore, it is clear from the claims, and reinforced by the specification, that gating intervals are determined based upon motion data (e.g., when motion slows to a certain level or speeds up to a certain level).

In spite of the apparent sufficiency of the claim language and of the discussion in the specification, the examiner has relied upon extrinsic evidence to define the term "gate." Specifically, the examiner cited Merriam Webster's dictionary definition of the term "gate" as "a device (as in a computer) that outputs a signal when specified input conditions are met <*logic* gate>." *See* Final Office Action mailed on July 23, 2007, page 2 (emphasis in original). From this extrinsic evidence the examiner surmised, in obvious hostility to both the claim language and the teachings of the specification, that the term "gate" should be interpreted to mean "any interval in which specified conditions for imaging are met," despite the plain language of each independent claim relating the initiation and termination thresholds of the gating intervals to derived motion attributes. *Id.* at 3 (emphasis added). Thus, the examiner has relied upon extrinsic evidence to justify an overly expansive interpretation of the term "gate" that is inconsistent not only with the teachings of the present specification, but with the plain language of the claims themselves.

The examiner further proceeded to use this interpretation of the term "gate" to assert that the Riederer reference teaches a gating interval as claimed despite the fact that the Riederer reference instead appears to teach the use of an imaging interval which

continues for a set time period (e.g., up to twenty seconds) before terminating. *See, e.g.,* Riederer, col. 2, lines 3-13; col. 5, lines 41-43. In other words, the Riederer reference does not appear to teach the use of gating intervals derived from motion data, as presently claimed, but instead based on a set time interval, regardless of motion. In summation, the examiner's use of extrinsic evidence, here a general purpose dictionary, to define terms which the specification clearly explains constitutes legal error. More precisely, the dictionary definition of the term "gate" relied upon by the examiner is associated with electronics in general and bears only a tangential relation to the meaning understood by those skilled in the art in the specific field of imaging, as discussed in the specification. Indeed, it is unclear what basis the examiner has in suggesting that one skilled in the art of medical imaging, after reviewing the present specification, would select this proposed definition of the term "gate" as appropriate or relevant.

In the Examiner's Answer, the Examiner maintained this interpretation of the term "gating." *See* Examiner's Answer, pages 8-9. In particular, the Examiner stated that:

> The Examiner maintains that, although the claims have in fact been considered in light of the specification, it is the Examiner's duty to rely upon their broadest reasonable interpretation when determining patentability of those claims in view of the prior art. Nowhere in the above-referenced passages of the pending disclosure does Appellant explicitly set forth a re-definition of the term "gating" from that which is commonly known in the art as meaning only initiation and termination of a process based upon motion data. It has previously been held that, where an applicant wishes to act as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that term (*Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 Fed. Cir. 1999). A

> mere discussion of specific examples of types of gating, as is presented in page 1 lines 23-26, page 4 lines 4-7, page 11 lines 11-15 of the present specification, does not constitute such a statement. Accordingly, it is reasonable and proper for Examiner to rely upon the definition set forth in a general purpose dictionary such as Merriam Webster, to determine the boundaries of the broadest reasonable interpretation of the term "gating".
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> *Id.* at page 9 (emphasis added).

However, the applicants note that the examiner actually supports the applicants' interpretation of the term "gating" by making the statement that it "is commonly known in the art as meaning only initiation and termination of a process based upon motion data." The applicants point out that this is essentially the interpretation of the term "gating" that the applicants continue to espouse. Furthermore, if this particular interpretation of the term "gating" is "commonly known in the art" as the examiner contended, then the examiner's reliance on the proposed dictionary definition is clearly improper, especially considering the inconsistencies between the two interpretations.

Furthermore, the applicants contend that the examiner has placed far too much emphasis on the term "broadest" and far too little emphasis on the term "reasonable" in finding the "broadest reasonable interpretation" of the claims. Moreover, the applicants note that the examiner must not merely find the broadest reasonable interpretation of the claims. Rather, the examiner must give claims the broadest reasonable construction in light of the specification as it would be interpreted by one of ordinary skill in the art. *See, e.g., In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364, 70 U.S.P.Q.2d 1827 (Fed. Cir. 2004); *see also In re Cortright*, 165 F.3d 1353, 1359, 49 U.S.P.Q.2d 1464, 1468 (Fed. Cir. 1999). The applicants contend that the examiner's extrinsic dictionary definition of the term "gating" is not reasonable in light of the specification as it would be

interpreted by one of ordinary skill in the art in the field of imaging, as the examiner's own admissions appear to demonstrate.

For example, the applicants point to Figures 2 through 5 of the present application. All four of these figures make clear that gated image data is acquired by (1) acquiring respiratory motion data, (2) deriving attributes of motion data, (3) obtaining motion thresholds, and (4) acquiring/selecting the gated image data based upon the motion thresholds. *See, e.g.,* Application, FIGS. 2-5. Therefore, the applicants contend that one of ordinary skill in the art in the field of imaging would interpret the term "gated image data" in light of the specification as being determined based upon motion data (e.g., when motion slows to a certain level or speeds up to a certain level). Moreover, the terms "gating" and "gating intervals" should be similarly interpreted in this context. Therefore, the applicants again submit that relying on extrinsic dictionary evidence to define the term "gating" was improper since the extrinsic dictionary definition used by the examiner is not reasonable in light of the specification as it would be interpreted by one of ordinary skill in the art in the field of imaging.

The examiner also argued that the applicants, acting as their own lexicographer, had not clearly redefined a claim term so as to put one reasonably skilled in the art on notice that the applicants intended to redefine the claim term. *See* Examiner's Answer, page 9. However, the applicants were not acting as their own lexicographer or redefining a claim term. Rather, in the previously filed Appeal Brief, the applicants merely pointed out that one skilled in the art would understand, in light of the specification and common usage, the terms "gating" and "gating intervals" without the need for the applicants to redefine the terms.

Furthermore, even if the applicants had been trying to act as their own lexicographers, the examiner's extrinsic dictionary evidence would still not be reasonable in light of the evidence in the specification, as discussed above. *See, e.g.,* Application, Figure 2-5. Indeed, the applicants again refer to the examiner's own statement that the term "gating" is "commonly known in the art as meaning only initiation and termination of a process based upon motion data." *See* Examiner's Answer, page 9. Therefore, the examiner even appears to acknowledge that redefining the term "gating" is unnecessary in order for one skilled in the art to interpret the term as the applicants contend is proper.

Deficiencies of the Riederer Reference: Independent Claims 1, 13, and 25

Further, even if the examiner's present claim construction was not found erroneous, the Riederer reference relied upon by the examiner still appears to be deficient. In particular, independent claims 1, 13, and 25 each generally recite deriving a termination threshold from one or more motion attributes. The Riederer reference, however, does not appear to disclose such a termination threshold derived from one or more attributes of motion. Instead, the Riederer reference appears to disclose that once data acquisition is initiated, it continues for a set time period (e.g., up to twenty seconds) before terminating. *See, e.g.,* Riederer, col. 2, lines 3-13; col. 5, lines 41-43. In other words, there is no termination threshold based on motion in the Riederer reference, and termination of data acquisition instead appears to be based upon a set time (which appears to correspond to the projected length of a breath-hold) elapsing. *Id.* Indeed, it appears to be assumed by the Riederer reference that the patient will merely continue to hold still during a breath-hold until image acquisition is complete so there is no reason why the Riederer reference would disclose a termination threshold based on motion. *Id.*, col. 6, lines 62-66.

However, the examiner has stated that "Riederer ('844) terminates imaging when the diaphragm is moving, which accordingly constitutes a termination threshold based on motion." Final Office Action mailed on July 23, 2007, page 2. Unfortunately, the examiner did not provide a specific reference within the Riederer reference to support this conclusory statement. *Id.* Furthermore, upon a close reading of the Riederer reference, the applicants are unable to find any suggestion that imaging terminates when the diaphragm begins moving. To the contrary, as noted above, all instances in the Riederer reference appear to characterize the data acquisition as continuing for a set time period. Riederer, col. 2, lines 3-13; col. 5, lines 41-43. To the extent that the Reiderer reference discusses diaphragm motion, it is to provide visual feedback to the patient, allowing the patient to suspend respiration consistently, i.e., to hold their breath with their diaphragm in a consistent position so that the image acquisition can be initiated. *Id.*, Abstract; col. 2, lines 3-7. If, indeed, the Reiderer reference does teach the termination of imaging based upon the motion of a diaphragm, the applicants have respectfully requested that the examiner provide a citation to this teaching, as required under 37 C.F.R. §1.104(c)(2). At this time, however, no such citation has been provided and the applicants can only conclude that the examiner cannot support the present rejection.

In the Examiner's Answer, the examiner argued that the Riederer reference "does in fact terminate imaging at the initiation of diaphragm movement." *See* Examiner's Answer, page 10. In particular, the examiner stated that:

> While it is true that Riederer ('844) acquires image data for a set time period, Examiner maintains that this set time period does not teach away, nor is it mutually exclusive from the step of terminating image data acquisition at a motion threshold as recited in the current claims. Riederer ('844) states that the breath hold time ("set time period") is determined by using a respiration monitor to observe the acceptable amount of breath hold time for that particular subject, and the reference also goes

> on to state that "the degree of chest inflation is monitored with NMR measurements of the superior-inferior (S/I) position of the patient's diaphragm" (col. 5 lines 48-53). The length of the breath hold cycle is thus determined from motion data by Riederer ('844), and since image data acquisition is disclosed to occur concurrently to such a breath hold (col. 5 lines 28-30), one of ordinary skill would recognize that, in the reference method, image acquisition terminates at the end of the breath hold (Fig. 3), and this breath hold end constitutes a threshold as claimed. It is inherent that, upon termination of a breath hold, a patient's diaphragm begins to move in order to initiate normal respiration. Therefore, it can be said that Riederer ('844) does in fact terminate imaging at the initiation of diaphragm movement as stated in the previous rejection.
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> *See* Examiner's Answer, pages 9-10.

The applicants take exception to the examiner's contention that "Riederer ('844) states that the breath hold time ('set time period') is determined by using a respiration monitor to observe the acceptable amount of breath hold time for that particular subject." This suggests that the "set time period" is determined for a particular subject based on motion data for that subject. The applicants strongly contend that the Riederer reference simply discloses no such thing. Rather, the passage cited by the examiner merely discloses that "an acceptable breath-hold" is detected. *See, e.g.,* Riederer, col. 5, lines 48-53. All this passage means is that the subject may be monitored such that it may be determined whether an adequate breath-hold has been attained by the subject. In other words, the subject is simply monitored to make sure that the subject has adequately inhaled such that the set time period of data acquisition may begin. This passage from the Riederer reference in no way suggests that the "length of the breath hold cycle" is determined from motion data, as the examiner suggested. *See* Examiner's Answer, page 10. Rather, in multiple passages, the Riederer reference suggests that data acquisition merely continues for a "reasonable time period (e.g. up to 20 seconds) before it

terminates." *See, e.g.,* Riederer, col. 2, lines 7-13; col. 5, lines 41-43. Therefore, the applicants submit that the Riederer reference does not disclose "terminat[ing] imaging at the initiation of diaphragm movement," as suggested by the examiner. *See* Examiner's Answer, page 10.

Dependent Claims 2-12, 14-24, and 26-32

The present dependent claims are believed to be allowable due to their dependence from the independent claims discussed above. In addition, however, the applicants note that the present dependent claims 2-12, 14-24, and 26-32 are also believed to be allowable for the subject matter they separately recite. For example, dependent claims 6 and 18 generally recite the selection of a set of gated image data from a set of image data. Such subject matter appears to be absent from the Riederer reference. Further, in view of the subject matter described in the Riederer reference, one would not expect such subject matter to be disclosed. In particular, the Riederer reference appears to relate to the initiation of acquisition of image data based on diaphragm location, i.e. differential acquisition. *See, e.g.,* Riederer, col. 5, lines 26-41, 48-50; col. 6, lines 29-66. As recited in claims 6 and 18, however, the set of gated image data is selected from a set of image data, i.e., selection is retrospective based on already acquired data. In other words, the recitations of claims 6 and 18 involve selecting a set of gated data from a larger set of image data, i.e., the acquisition is not differential, the selection of a subset of gated data from a larger set of image data is. Such subject matter appears to be entirely absent from the Riederer reference.

In the Examiner's Answer, the examiner argued that the Riederer reference discloses "post-acquisition selection of breath-hold image data" and, thus, discloses retrospective gating of image data. *See* Examiner's Answer, page 10. In particular, the examiner stated that:

> Riederer ('844) discloses registration of movement data to image data (col. 2 lines 36-41). Such registration must inherently occur post-acquisition, as it is not possible to register two sets of data that have not yet been acquired. Examiner maintains that, by registering the image data to the diaphragm motion data, one is effectively identifying those portions of the image data that respond to the time period of least diaphragm movement, which is disclosed by the reference to be the desirable and useful portion of the image data (col. 1 lines 31-50, col. 2 lines 1-6). Riederer ('844) uses this portion of image data acquired during minimal movement to calculate an average dataset that has improved signal-to-noise ratio (col. 2 lines 36-48). By such post-acquisition selection of breath-hold image data, Riederer ('844) does in fact retrospectively gate the data.
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> *See id.*

Therefore, it appears the examiner bases the argument primarily on the conclusory statement that registration of motion data to image data "must inherently occur post-acquisition, as it is not possible to register two sets of data that have not yet been acquired," without any evidence to support the statement. The applicants contend that, unlike certain image registration procedures, which may require image data to be registered after being acquired, there is no similar need for movement data and image data to be registered after the data have been acquired. Indeed, the applicants can find no passage within the Riederer reference which suggests that motion data and image data must necessarily be registered post-acquisition. It is entirely possible that registration of motion data and image data may be done during acquisition of the data, such as based on one or more anatomical or fiducial reference points or markers.

Furthermore, dependent claims 10 and 22 recite the act of determining if one or more scan parameters are satisfied. Such subject matter is discussed in the specification at page 15, line 6 to page 16, line 15. This subject matter also appears to be entirely

absent from the Riederer reference. In the Examiner's Answer, the examiner argued that the Riederer reference does, in fact, disclose this element, stating that:

> Riederer states that "a respiration monitor is required to detect an acceptable breath-hold and to generate the respiratory trigger pulse" (col. 5 lines 48-51). Examiner interprets the step of detecting an acceptable breath-hold to constitute "determining if one or more scan parameters are satisfied" as is currently recited by the instant claims; i.e., the acceptability of the breath-hold is a scan parameter.
>
> *See* Examiner's Answer, page 10.

The applicants contend that the acceptability of a breath-hold cannot reasonably be interpreted as a "scan parameter" (i.e., a parameter of a scan). For instance, the specification discusses various types of "scan parameters" which, when satisfied, may generate a notification. *See, e.g.,* Application, page 15, line 6 – page 16, line 15. These may include a designated number of slices imaged, a designated number of images acquired, or a designated duration (i.e., parameters of a scanning operation or procedure). *Id.* In each of these situations, the parameter is related to how scanning is progressing. Therefore, the applicants contend that detecting whether an acceptable breath-hold has occurred before scanning begins cannot reasonably be interpreted as a "scan parameter."

Moreover, the applicants point out the contrasting claim language of dependent claims 11 and 12 of the present application. Dependent claim 11 recites that a notification may be generated "if the one or more scan parameters are not satisfied" while dependent claim 12 recites that a notification may be provided "indicating a breath hold status." These separate dependent claims suggest that a "breath hold status" is entirely different than a "scan parameter" as used in the present claims.

In view of the various deficiencies of the Riederer reference noted above, no *prima facie* case of anticipation is believed to exist with regard to independent claims 1, 13, and 25. Furthermore, those claims depending from independent claims 1, 13, and 25 are believed to be allowable at least for their dependence from their respective independent claims.

Rejections Under 35 U.S.C. §103

In the Examiner's Answer, the examiner rejected claims 9 and 21 under 35 U.S.C. §103(a) as being anticipated by the Riederer reference. The applicants respectfully traverse this rejection.

Legal Precedent and Guidelines

The burden of establishing a *prima facie* case of obviousness falls on the examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). To establish a *prima facie* case, the examiner must show that a combination or modification of references includes *all* of the claimed elements, *and* also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *See Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). Moreover, the Supreme Court has stated that the obviousness analysis should be explicit. *See KSR Int'l Co. v. Teleflex, Inc.,* No. 04-1350, page 14 (U.S., decided April 30, 2007). "[R]ejections based on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *See id.* (quoting *In re Kahn,* 441 F.3d 977,988 (Fed. Cir. 2006)).

Deficiencies of the Rejection

With regard to claims 9 and 21, the applicants respectfully note the deficiencies of the Riederer reference noted above with regard to the discussion related to anticipation. In view of these deficiencies, and in view of the dependence of claims 9 and 21 from the independent claims discussed herein, no *prima facie* case of obviousness is believed to exist with regard to claims 9 and 21.

Conclusion

In view of the remarks and amendments set forth above, the applicants respectfully request allowance of the pending claims. If the examiner believes that a telephonic interview will help speed this application toward issuance, the examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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/John Rariden/

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